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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/885,811	06/19/2001	Richard W.D. Booth	034942-245	4376

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EXAMINER

NGUYEN, DUNG X

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 03/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/885,811

Applicant(s)

BOOTH ET AL.

Examiner

Dung X Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on September 20, 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 3 and 5 - 7 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on September 20, 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

Response to Arguments

1. Applicant's arguments filed on September 20, 2004 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. **Claim 1 is rejected** under 35 U.S.C. 102(e) as being anticipated by Huttunen (U.S. patent application publication # 2002/0016154 A1).

Regarding claim 1, Huttunen discloses (figure 1):

A method of generating feedback information in IQ form for linearity compensation of a communications transmitter using polar modulation and having an communications signal amplifier having an input signal and producing an output signal (abstract and page 2, second column, paragraph 0019, lines 23 - 25), comprising:

- Using the output signal, producing an output measurement signal (9);
- Using the input signal, producing an input measurement signal exhibiting varying phase and a constant envelope (abstract and page 1, first column, paragraph 0003, lines 27 - 28);

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- Shifting one of the output measurement signal (15, page 2, first column, paragraph 0018) and the input measurement signal (paragraph 0019) by substantially 90 degrees to produces a quadrature measurement signal (page 2, first column, paragraph 0017, line 3 to page 2, second column, paragraph 0019);
- Mixing the input measurement signal with the output signal in Table calculation (17), (phase table 20), block (4) to produce resulting in-phase and quadrature components, the in-phase and quadrature components representing a phase difference between the input signal and the output measurement signal (page 2, first column, paragraph 0017, line 3 to page 2, second column, paragraph 0019).

Regarding claim 2, Huttunen discloses (figure 1, abstract, page 2, second column, paragraph 0019, lines 23 – 25) a method of generating feedback information in IQ form for linearity compensation of a communications transmitter using polar modulation, comprising:

- Using polar modulator to produce a phase-modulated signal and an amplitude signal (I_{in} and Q_{in});
- PA (8) for combining the phase-modulated signal and the amplitude signal to produce an output signal;
- Using an IQ demodulator to produce feedback information for linearity compensation, the IQ demodulator receiving as inputs signal the phase-modulated signal and the output signal and producing as output signals in-phase and quadrature components representing a phase difference between the phase-modulated signal and the output signal (page 2, first column, paragraph 0017, line 3 to page 2, second column, paragraph 0019).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be

patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claim 2 is also rejected** under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (U.S. patent application publication # 2001/0010713 A1), and further in view of Grange (U.S. patent application publication # 2004/0046607 A1).

Regarding claim 2, Yamamoto discloses (figure 2, page 1, first column, paragraph 0003 to page 2, first column, paragraph 0009) a transmitter for transmitting a data signal, comprising:

- Blocks (4, 5, 6, 7, 8) for combining the phase-modulated signal and the amplitude signal to produce an output signal (page 1, second column, paragraph 0006).
- Using an IQ demodulator to produce feedback information for linearity compensation, the IQ demodulator receiving as input signals the phase-modulated signal and the output signal, and producing as output signals in-phase and quadrature component representing a phase difference between the phase-modulated signal and the output signal (abstract and page 1, first column, paragraph 0003).

Yamamoto differs from the instant claimed invention that it does not show the step of using a polar modulator to produce a phase-modulated signal and an amplitude signal.

However, Grange discloses the step of using a polar modulator to produce a phase-modulated signal and an amplitude signal (page 1, second column, paragraph 0012).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Yamamoto and Grange as providing the requirements of the instant claimed invention for improving the control the phase of the feedback amplifier circuit (page 1, first column, paragraph 0002 of Yamamoto).

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6. **Claim 3 is rejected** under 35 U.S.C. 103(a) as being unpatentable over Willis et al. (U.S. patent # 5,646,627), and further in view of Shanley, II (U.S. patent # 4,135,200).

Regarding claim 3, Willis et al. discloses (figure 9, abstract, and column 2, lines 32 – 52) a communications signal for transmitting a data signal, comprising:

- A data modulator responsive to the data signal for producing modulated signal components including a magnitude component and a periodic signal containing a phase component (figure 9 and abstract, column 2, lines 32 – 52);
- Feedback circuitry responsive to the communication signal and to the periodic signal for producing feedback signal components in quadrature relation, the feedback signal components including information about phase difference between the communication signal and the periodic signal (figure 9, abstract, column 2, lines 19 – 28, and column 10, lines 31 – 52).

Willis et al. differs from the instant claimed invention that it does not show the step of an amplifier responsive to the data signal and to the periodic signal for producing a desired communication signal.

However, Shanley, II discloses the step of an amplifier responsive to the data signal and to the periodic signal for producing a desired communication signal (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Willis et al. and Shanley, II as providing the requirements of the instant claimed invention for improving the control signal (column 1, lines 5 – 10 of Shanley, II).

7. **Claim 5 is rejected** under 35 U.S.C. 103(a) as being unpatentable over Willis et al. (U.S. patent # 5,646,627), Shanley, II (U.S. patent # 4,135,200), and further in view of Genrich (U.S. patent # 6,661,852 B1).

Regarding claim 5, as followed by the limitations analyzed in claim 3, Willis et al. and Shanley, II differ from the instant claimed invention that they do not show the steps of:

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- A correction table for correcting the magnitude component and the phase component; and
- Adaptation means responsive to the feedback signal component adapting values of the correct table.

However, Genrich discloses:

- A table for correcting the magnitude component and the phase component (column 8, lines 6 – 56);
- Adaptation means responsive to the feedback signal components for adapting values of the correction table (column 2, lines 1 – 54).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Willis et al., Shanley, II, and Genrich as providing the requirements of the instant claimed invention for supplying the adaptation means to generate offset, gain, and phase correction (column 2, lines 42 – 59 of Genrich).

8. **Claim 6 is rejected** under 35 U.S.C. 103(a) as being unpatentable over Willis et al. (U.S. patent # 5,646,627), Shanley, II (U.S. patent # 4,135,200), Genrich (U.S. patent # 6,661,852 B1), and further in view of Eicher, Jr. et al. (US patent application publication # 2002/0099598 A1).

Regarding claim 6, as followed by the limitations analyzed in claim 5, Willis et al., Shanley, II, Wall et al., and Genrich differ from the instant claimed invention that they do not show the adaptation means is based on a statistical algorithm.

However, Eicher, Jr. et al. discloses that the adaptation means is based on a statistical algorithm (page 11, second column, paragraph 0137).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Willis et al., Shanley, II, and Eicher, Jr. et al. as providing the requirements of the instant claimed invention for supplying the adaptation means based on the statistical algorithm.

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9. **Claim 7 is rejected** under 35 U.S.C. 103(a) as being unpatentable over Willis et al. (U.S. patent # 5,646,627), Shanley, II (U.S. patent # 4,135,200), Genrich (U.S. patent # 6,661,852 B1), Eicher, Jr. et al. (US patent application publication # 2002/0099598 A1), and further in view of Ghosh (US patent # 6,011,813).

Regarding claim 7, as followed by the limitations analyzed in claim 6, Willis et al., Shanley, II, Genrich, and Eicher, Jr. et al. differ from the instant claimed invention that they do not show that wherein the statistical algorithm is the least mean squares (LMS) algorithm.

However, Ghosh discloses that wherein the statistical algorithm is the least mean squares (LMS) algorithm (column 2, lines 46 – 60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Willis et al., Shanley, II, Genrich, Eicher, Jr. et al., and Ghosh as providing the requirements of the instant claimed invention for supplying the adaptation means based on the statistical algorithm by Least Mean Square algorithm in order to minimized the Cost Function (column 2, lines 558 – 60 of Ghosh).

Allowable Subject Matter

10. **Claim 4 is objected** to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US patent application publications:

Vandersteen et al. (US patent application publication # 2002/0121892 A1) discloses a modulating device characterization method and apparatus.

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US patent documents:

Wilhite et al. (US patent # 5,930,689) discloses a method and its corresponding apparatus for producing a plurality of output signals with fixed phase relationships therebetween.

Contact Information

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung X. Nguyen whose telephone number is (571) 272-3010. The examiner can normally be reached on Monday through Friday from 8:00 AM to 17:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Ghayour H. Mohammad can be reached on (571) 272-3021. The fax phone numbers for this group is (571) 273-3021.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

DXN

February 01, 2005


MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER